MSD IGNITION INSTALLATION INSTRUCTIONS

MSD Advanced Power System Alternator

IMPORTANT: Review these instructions before attempting the alternator installation.

Parts Included In This Kit		Parts Required (not supplied)
1 - Alternator	1 - Battery Post Nut	1 - Pulley
1 - Pulley Nut	1 - 8mm Bolt	1 - Bracket Kit
1 - Pulley Spacer	1 - Cover Ring	

WARNING: Before installing the MSD Alternator disconnect the battery cables. After the Alternator is mounted, connect in the following order: Ground (-), Battery (+), Regulator. Never disconnect any electrical connection from the alternator or battery while the alternator pulley is rotating.

NOTE: To install the pulley, a 1/2" drive impact air gun is required.

PRE-INSTALLATION

The billet housing of the APS Alternator features a universal mounting method that requires a Bracket Kit, which must be purchased separately. Also, a Pulley that fits your drive belt system is required and is available separately.

CURRENT DRAW

Before installing the APS Alternator, it is recommended to determine the current requirements of your vehicle. This is important to confirm that you selected an alternator that can meet the demands of the electrical system. Figure 1 gives you a list of typical components and their average current draw. Your application may vary. Add all of the values to determine a maximum draw.

The APS Alternator is available in 105, 130 and 160 Amp models. Be sure you have a model that exceeds your vehicle's maximum current requirements.

Component	Average Current Requirement	Your System
Headlights	10 each	_____
AC Compressor	4	_____
Blower Motor	12	_____
Ignition	6 - 10	_____
Fuel Pump	6 - 15	_____
Water Pump	5 - 10	_____
Electric Fan	10 - 20	_____
Windshield Wipers	4	_____
Brake/Turn Signals	2	_____
Power Windows	7 each	_____
Power Locks	2	_____
Radio w/40 watts	13	_____
TV	2	_____
DVD Player	2	_____
Nitrous Solenoids	10	_____
Other	_____	_____
Total		_____

Figure 1 Determining Current Requirements.

DISASSEMBLY

Be sure to disconnect the battery prior to removing any wires or proceeding with the removal of the alternator. If you are replacing an alternator or generator that is already installed, mark the location of any wires, as well as their general mounted location (to help position the new APS).

For engines with a V-belt pulley system, remove the adjusting bolt of the alternator first, followed by the pivot or support bolts. For serpentine systems, remove the belt by releasing the tensioner's pressure. It is recommended to refer to your vehicle's service manual or your pulley system's instruction manual.

PULLEY INSTALLATION

The APS Alternator uses a standard 0.668" shaft so it will accept many common alternator pulleys. It is recommended to use a 0.468" wide belt with the MSD V-belt pulleys. The serpentine pulley from MSD uses five grooves and must only be used with other five groove pulleys. Pulley alignment is very important with serpentine pulley systems. MSD's V-belt pulleys are 2.64" in diameter and the serpentine pulley is 2.05". This provides an approximate alternator pulley to crankshaft ratio of 3:1. MSD's alternators are designed to produce full output current at 6,000-6,500 alternator shaft rpm.

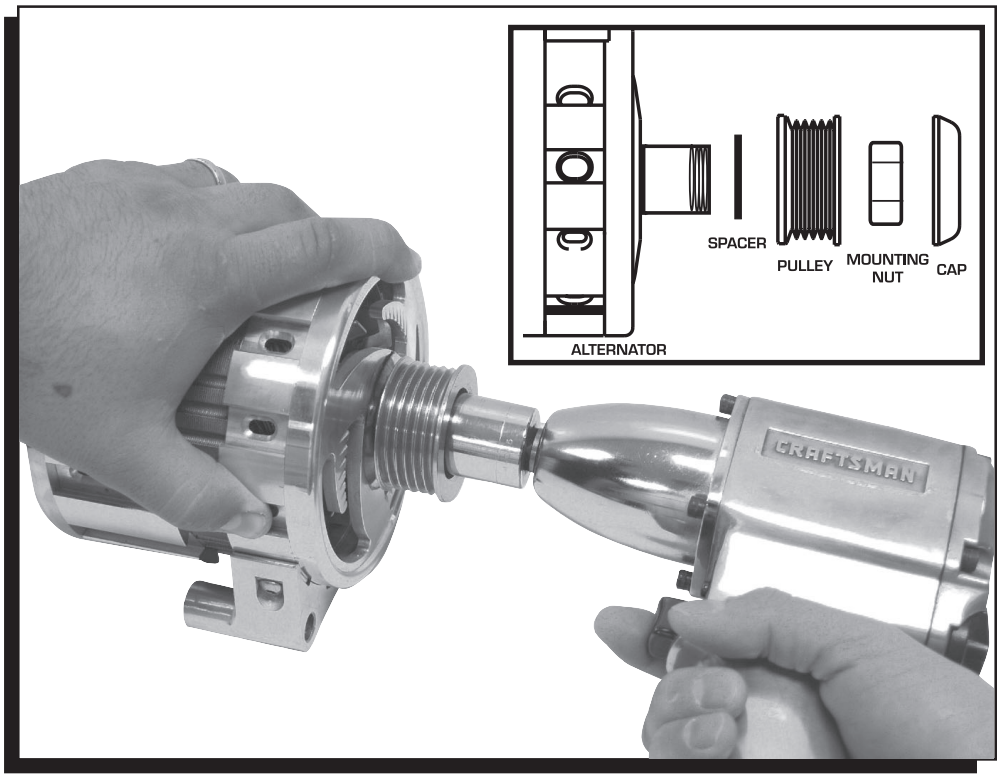


Figure 2 Installing the Pulley.

Note: It is recommended to use a 1/2" drive air impact gun with a supply of 90-psi of air and a 15/16" socket.

1. Install the supplied spacer followed by the pulley.
2. If a washer was supplied with the pulley install it, followed by the nut. Install the nut until it is finger-tight.

Caution: Do not attempt to stop the pulley from spinning while tightening the nut! Damage to the alternator will occur.

3. With the Alternator housing held secure, tighten the nut with the impact wrench for approximately 5 - 10 seconds (Figure 2). **Allow the shaft to spin as you tighten the nut.** Preventing the shaft from spinning will damage the alternator.
4. Once tight, spin the pulley to ensure smooth operation and proper installation.
5. With the pulley tightened, install the pulley cover (MSD pulleys only). It is recommended to apply Loctite to the two Torx head screws.

BRACKET INSTALLATION

The APS Alternator uses a universal mounting system that requires a Bracket Kit for your application. You will either need to use the original alternator to install the brackets in the correct location, or position the alternator near its mounts and install the brackets.

If you are replacing a GM alternator, look on the back of the original unit (Figure 3). Note the location of the mounting tab and hole. Be sure the APS Alternator is in the same position before installing the brackets.

1. Start with the lower bracket or the one that serves as the primary mount. Once this location has been identified on the alternator housing, insert the threaded Slide-Loc tabs into the designated slots on the Alternator (Figure 4).
2. With both threaded tabs in position, install the bracket and snug the two supplied screws (Figure 5). Do not tighten them at this point.
3. With one mount installed, the Alternator can be positioned on the engine to determine the location of the second bracket assembly.
4. Once determined, install the Slide-Loc threaded tabs and install the bracket.
5. Test the alternator's fit to the mounts as well as the belt alignment. The Slide-Loc mounts allow for easy adjustment to obtain correct belt alignment. If alignment is necessary, loosen the brackets and position the alternator housing into the correct position.
6. Install the belt to the pulleys or drive accessories. Once everything is aligned and positioned properly, tighten the Slide-Loc brackets in place.
7. Install the cover ring to the Alternator. It simply snaps together (Figure 6).

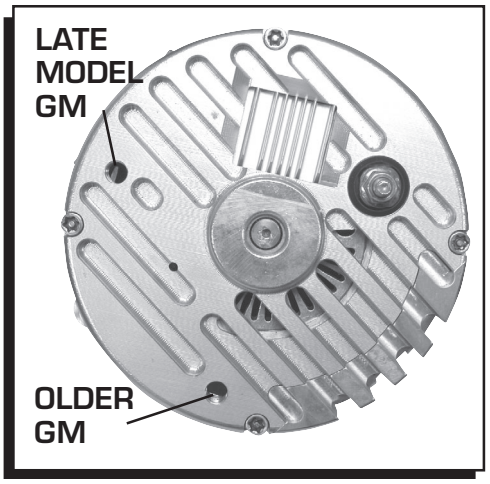


Figure 3 Mounts on GM Applications.

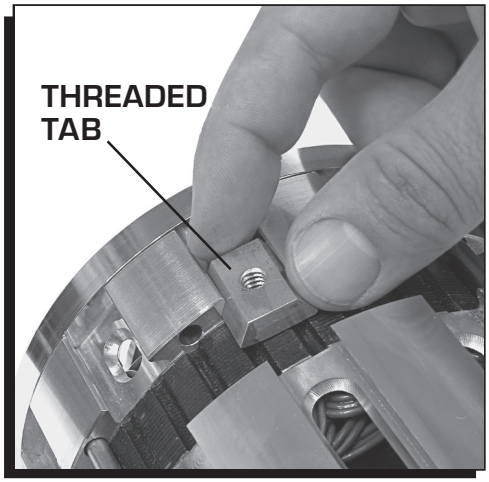


Figure 4 Installing the Slide-Loc Tabs.

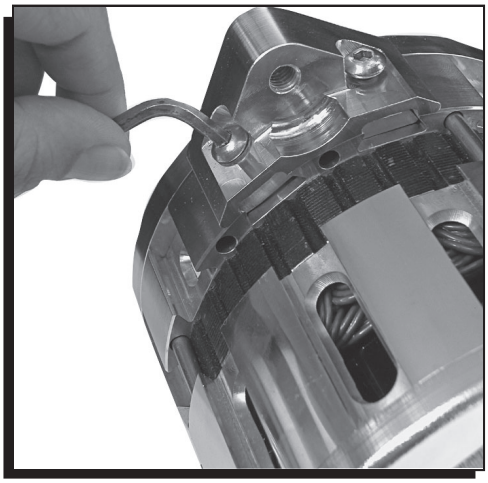


Figure 5 Installing the Brackets.

Figure 6 Installing the Cover Ring.

WIRING

The MSD APS Alternator is available in two versions for wiring; Direct Plug-In and One-Wire. The Direct Plug-In models use a wiring harness that is supplied with the specific Bracket Kit for your application.

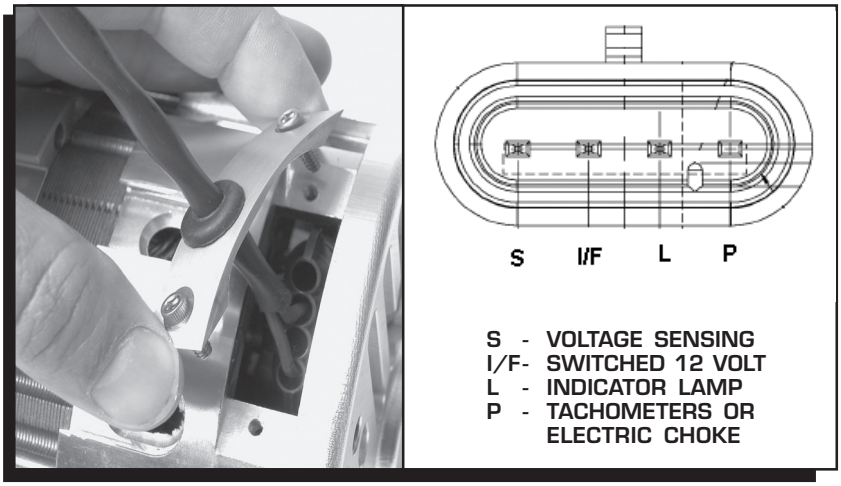


Figure 7 Wiring a Direct Plug-In Alternator.

DIRECT PLUG-IN

There are generally three wires that connect to the alternator; a battery source, one for an indicator or warning light, and a voltage sensing wire. Figure 7 and 8 illustrate wiring with a general Direct Plug-In wiring harness. This harness is supplied with the bracket kit.
The connector for the harness is located behind a small plate in the housing. Remove the two hex head screws and plug the harness into the connector. Position the grommet into the cover plate and screw it back in place.

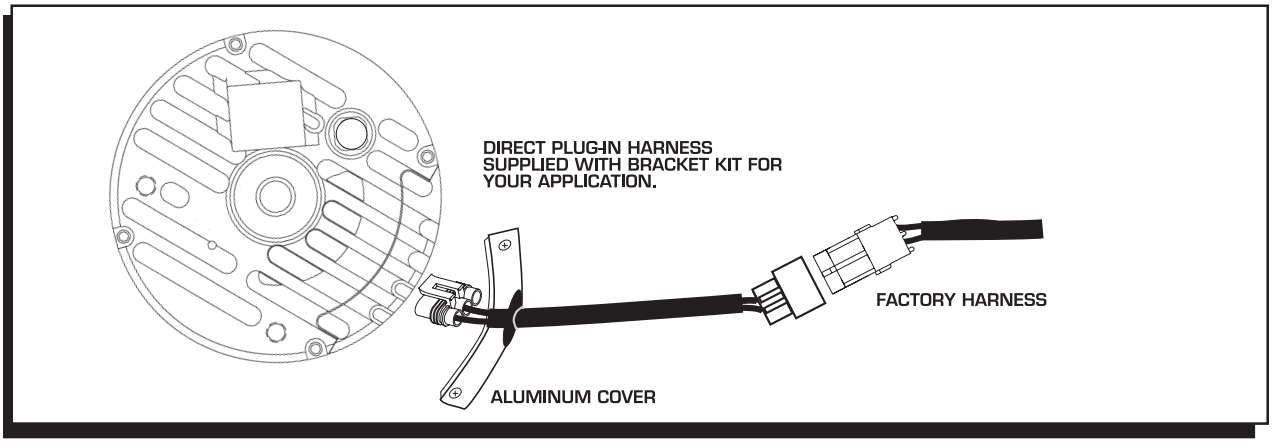


Figure 8 Wiring a Direct Plug-In Alternator.

Alternator-to-Crankshaft Ratio	Engine RPM
2:1	1,500-1,750
2.5:1	1,200-1,400
3:1	1,000-1,150

Figure 9 One-Wire Alternator Turn-On Charging RPM.

ONE-WIRE

The One-Wire APS uses a special regulator that determines when and how much to charge the electrical system. This circuitry must exceed a certain rpm to 'turn on' the charging system. The One-Wire APS models will begin charging between 3,000 - 3,500 pulley rpm (typically 1,500 - 1,750 rpm at the crankshaft.). Once this rpm level is achieved and the alternator begins charging, it will remain 'on' at lower rpm as well. The chart in Figure 9 shows at what engine speeds a One-Wire alternator will begin charging at in relation to the alternator-to-crankshaft pulley speed.

Charge Wire: The length and gauge of the wire used to connect a one-wire APS is imperative to your alternator's function. As the length of the charge wire grows, a larger gauge wire will be required. The chart in Figure 10 gives the recommended gauge wire that should be used regarding the length of the wire. When making the charge wire, be sure to use quality ring-lug terminals for proper connections.

OUTPUT	UP to 3'	3' - 7'	7' - 10'	10' - 13'	13' - 20'	LENGTH
105	8	8	6	4	4	GAUGE WIRE
130	6	6	4	2	2	
160	4	4	2	2	0	

Figure 10 Wire Length and Gauge Chart.

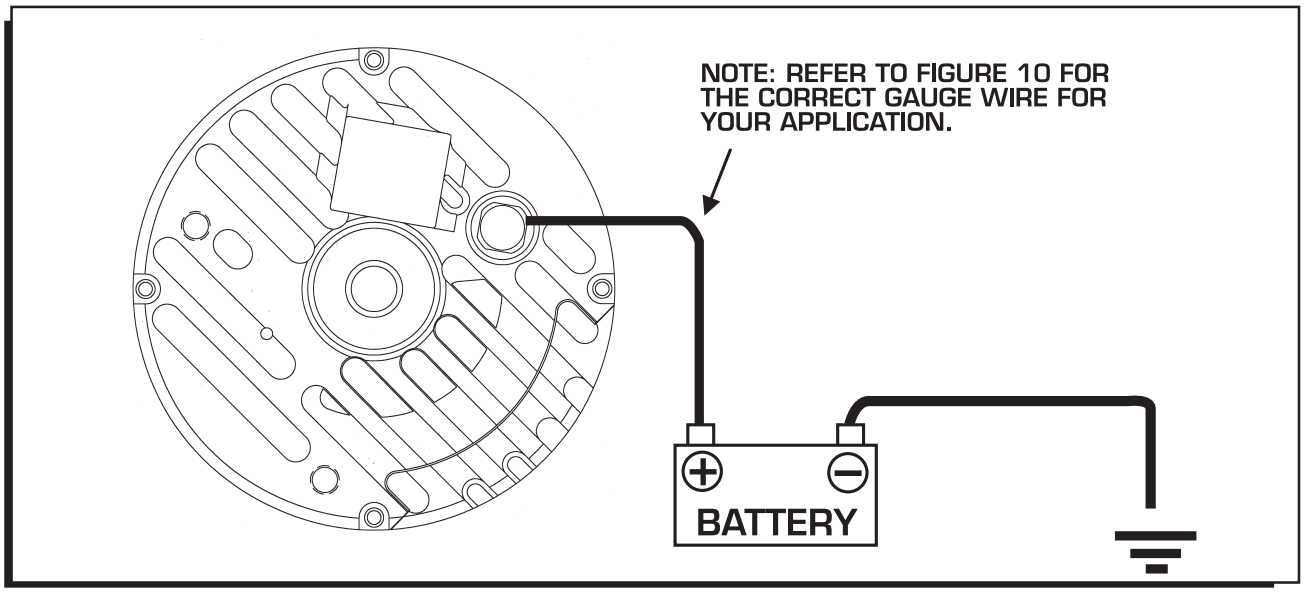


Figure 11 Wiring a One-Wire Alternator.

TROUBLESHOOTING AND TIPS

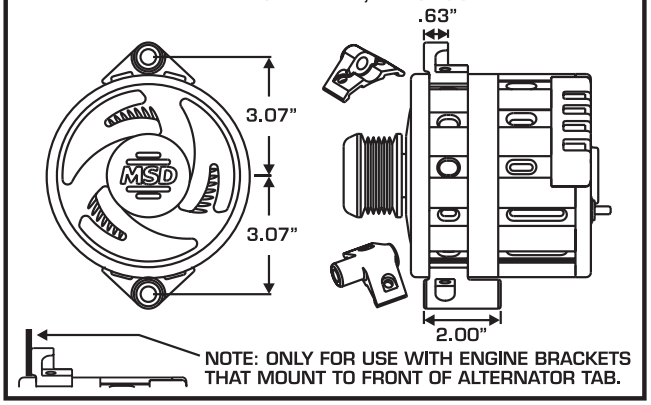
- Confirm that there is 12 volts on the battery terminal when the engine is off. When running, there should be 13 - 14.5 volts. (One-Wire alternations must be revved up to activate the charging circuit.)

- The Alternator is responsible for maintaining your vehicle's electrical system when the engine is running. It is important that a good quality battery is used.

Diesel Engines: On One-Wire models, the 'P' terminal on the connector is active so a tachometer can be installed.

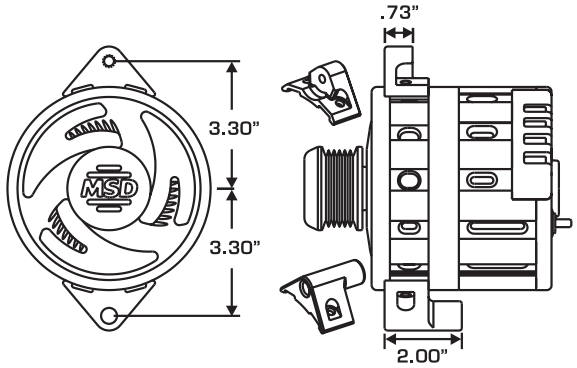
GM SHORT MOUNT KIT

PLUG-IN, PN 5155
ONE-WIRE, PN 5159
THREADED PLUG-IN, PN 5156
THREADED ONE-WIRE, PN 5158



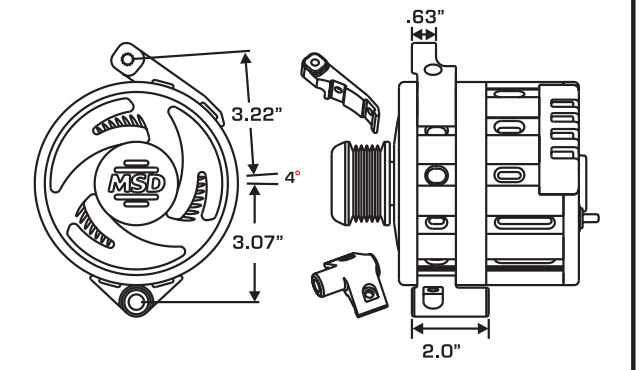
GM & IHC KITS TALL MOUNT

PLUG-IN, PN 5157
ONE-WIRE, PN 5162
THREADED PLUG-IN, PN 5164
THREADED ONE-WIRE, PN 5165



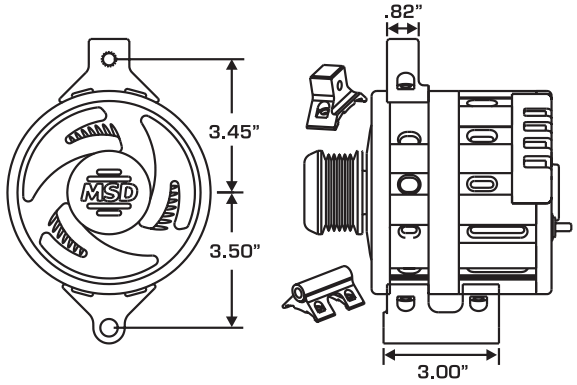
GM KIT 1988-1991 V8

PN 5163



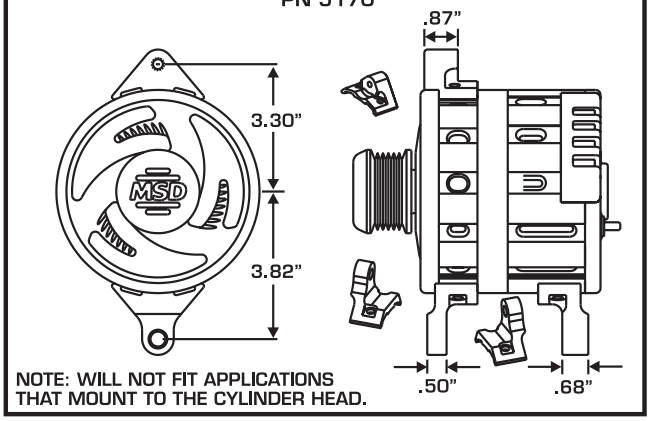
FORD KITS 1, 2, 3, 6G

PLUG-IN, PN 5166
ONE-WIRE, PN 5168



CHRYSLER/DODGE KIT WITH THREADED MOUNT

PN 5170



ALTERNATOR DIMENSIONS

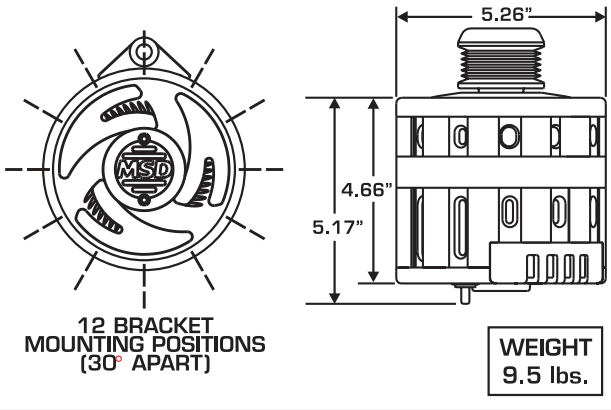


Figure 12 Bracket Dimensions and Information.

TECH NOTES

TECH NOTES

Service

In case of malfunction, this MSD component will be repaired free of charge according to the terms of the warranty. When returning MSD components for service, Proof of Purchase must be supplied for warranty verification. After the warranty period has expired, repair service is charged based on a minimum and maximum charge.

Send the unit prepaid with proof of purchase to the attention of: **Customer Service Department, MSD Ignition, 12120 Esther Lama, Suite 114, El Paso, Texas 79936**.

When returning the unit for repair, leave all wires at the length in which you have them installed. Be sure to include a detailed account of any problems experienced, and what components and accessories are installed on the vehicle.

The repaired unit will be returned as soon as possible after receipt, COD for any charges. (Ground shipping is covered by warranty). All units are returned regular UPS unless otherwise noted. For more information, call the MSD Customer Service Line (915) 855-7123. MSD technicians are available from 8:00 a.m. to 5:00 p.m. Monday - Friday (mountain time).

Limited Warranty

MSD IGNITION warrants MSD Ignition products to be free from defects in material and workmanship under normal use and if properly installed for a period of one year from date of purchase. If found to be defective as mentioned above, it will be replaced or repaired if returned prepaid along with proof of date of purchase. This shall constitute the sole remedy of the purchaser and the sole liability of MSD Ignition. To the extent permitted by law, the foregoing is exclusive and in lieu of all other warranties or representations whether expressed or implied, including any implied warranty of merchantability or fitness. In no event shall MSD Ignition be liable for special or consequential damages.